

ABSTRACT OF THE DISCLOSURE

The present invention provides a semiconductor device having a multilayer wiring structure including a lower Cu buried-wiring layer, a SiC film, a SiOC film of 400 nm in thickness functioning as an interlayer insulating film, and an upper Cu buried-wiring layer electrically connected to the lower buried-wiring layer through contact plugs passing through the interlayer insulating film. The contact plugs and the upper Cu buried wiring layer are formed a single burying step of the dual damascene process. The SiOC film has a carbon content of about 12 atomic % and a relative dielectric constant of about 3.0. The upper Cu buried wiring layer is formed by burying a Cu film, through a barrier metal, in wiring grooves which are provided in the inter-wiring insulating film including a laminated film of an organic film, e.g., a PAE film of 200 nm in thickness, and a SiOC film of 150 nm in thickness.